

What is claimed is:

- 5 1. A method for scanning a bag to determine if the bag poses a threat, the method comprising:
- performing a CT scan of the bag to produce CT scan data;
- processing the CT scan data to obtain lineogram data;
- determining measured values for x-ray attenuation and size of a first object in the bag
- 10 based on the lineogram data;
- comparing the measured values to predetermined values; and
- if the measured value is below the predetermined value for at least one of x-ray attenuation and size then determining that the object does not pose a threat and clearing the bag.
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2. The method of claim 1 wherein the method further comprises, prior to performing a CT scan:
- determining if a passenger associated with the bag is a selectee;
- if the passenger is not a selectee, then inspecting the bag by using a CT scanner
- 20 system to obtain projection image data only; and
- if the passenger is a selectee, then inspecting the bag by using the CT scanner system to obtain CT data,
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3. The method of claim 2 wherein the selectee is a CAPPS selectee.
4. The method of claim 2 wherein the CT scan is performed by a CT scanner with a gantry and wherein inspecting the bag by using a CT scanner system to obtain projection image data comprises:
- using the CT scanner to obtain projection image data without rotating the gantry.

5. The method of claim 1 wherein the lineogram data comprises moving-sinogram data.
6. A method for scanning a container to determine if the container poses a threat, the method
5 comprising:
- performing a CT scan of the container to produce CT scan data;
 - processing the CT scan data to create lineogram data;
 - determining a measured value for a characteristic of a first object in the container
based on the lineogram data;
 - 10 comparing the measured value to a predetermined value; and
 - if the measured value has a specified relationship to the predetermined value then
determining that the object does not pose a threat.
7. The method of claim 6 wherein determining a measured value comprises:
- 15 determining a measured value for x-ray attenuation based on the lineogram data.
8. The method of claim 6 wherein determining a measure value comprises:
- determining a measure value for size of the first object in the container.
- 20 9. The method of claim 6 wherein the method further comprises, prior to performing a CT
scan:
- determining if a passenger associated with the container is a selectee;
 - if the passenger is not a selectee, then inspecting the container by using a CT scanner
system to obtain projection image data only; and
 - 25 if the passenger is a selectee, then inspecting a bag associated with the passenger by
using the CT scanner system to obtain CT data.

10. The method of claim 9 wherein the CT scan is performed by a CT scanner with a gantry and wherein inspecting the bag by using a CT scanner system to obtain projection image data comprises:

using the CT scanner to obtain projection image data without rotating the gantry.

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11. A CT scanner system for scanning a container to determine if the container poses a threat, the system comprising:

a CT scanner having a rotating gantry and operative to perform a CT scan of a container;

10 a conveyor for advancing a container through the CT scanner;

a host processor in communication with the CT scanner and operative to receive data from the CT scanner; and

a detection processor in communication with the host processor and operative to:

receive CT data from the CT scanner and process the CT data to create

15 lineogram data;

determine a measured value for a characteristic of a first object in the container based on the lineogram data;

compare the measured value to a predetermined value; and

if the measured value has a specified relationship to the predetermined value

20 then determine that the object does not pose a threat.

12. The system of claim 11 wherein the host processor and the detection processor are the same processor.

25 13. The system of claim 11 wherein providing a CT scanner system comprises providing a plurality of CT scanner systems, wherein the systems are multiplexed together, each CT scanner system in communication with a review station, and wherein the data obtained by the CT scanner systems are transmitted to the review station for review by an operator.

14. A method for scanning a bag to determine if the bag poses a threat, the method comprising:

providing a CT scanner system;

5 determining if a passenger is a selectee;

if the passenger is not a selectee, then inspecting a bag associated with the passenger by using the CT scanner system to obtain projection image data; and

if the passenger is a selectee, then inspecting a bag associated with the passenger by using the CT scanner system to obtain CT data.

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15. The method of claim 14, wherein providing a CT scanner system comprises providing a plurality of CT scanner systems, wherein the systems are multiplexed together, each CT scanner system in communication with a review station, and wherein the data obtained by the CT scanner systems are transmitted to the review station for review by an operator.

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16. The method of claim 14 wherein providing a CT scanner system comprises providing a CT scanner system with a gantry and wherein inspecting the bag by using a CT scanner system to obtain projection image data comprises:

using the CT scanner to obtain projection image data without rotating the gantry.

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17. The method of claim 14 wherein inspecting the bag by using the CT scanner system to obtain CT data comprises:

performing a CT scan of the bag to produce CT scan data;

processing the CT scan data to obtain lineogram data;

25 determining measured values for x-ray attenuation and size of a first object in the bag based on the lineogram data;

comparing the measured values to predetermined values; and

if the measured value is below the predetermined value for at least one of x-ray attenuation and size then determining that the object does not pose a threat.

18. A scanner system for scanning a container to determine if the container poses a threat, the
5 system comprising:

a scanner operative to perform a scan of a container;

a conveyor for advancing a container through the scanner;

a host processor in communication with the scanner and operative to receive data
from the scanner; and

10 a detection processor in communication with the host processor and operative to:

receive data from the scanner and process the data to create processed data;

determine a measured value for a characteristic of a first object in the
container based on the processed data;

compare the measured value to a predetermined value; and

15 if the measured value has a specified relationship to the predetermined value
then determine that the object does not pose a threat.

19. The system of claim 18 wherein the scanner includes a projection x-ray scanner.

20 20. The system of claim 18 wherein the scanner includes a CT scanner.

21. The system of claim 18 wherein the scanner includes a projection x-ray scanner and a CT
scanner.

25 22. A system for detecting a barrel of a weapon in a container, the system comprising:

- a CT scanner operative to perform a CT scan of a container;
- a conveyor for advancing a container through the CT scanner;
- a host processor in communication with the CT scanner and operative to receive CT data from the CT scanner; and
- 5 a detection processor in communication with the host processor and operative to:
 - reconstruct slice data;
 - analyze the slice data to determine if at least one of a hollow circular shape and an oval shape of a known diameter exists, the shape being surrounded by metal or dense plastic;
 - 10 if the shape does not exist, then determine if the detection processor has analyzed the last slice for the container;
 - if the detection processor has not analyzed the last slice for the container, then analyzing the next slice to determine if at least one of a hollow circular shape and an oval shape of a known diameter exists, the shape being surrounded by metal or dense plastic; and
 - 15 if the detection processor has analyzed the last slice for the container, then determining that no gun was found in the container.

23. A system for scanning a bag to determine if the bag poses a threat, the system comprising:

- 20 a scanner operative to perform a scan of a container;
- a conveyor for advancing a container through the scanner;
- a host processor in communication with the scanner and operative to:
 - receive scan data from the scanner;
 - receive data regarding whether a passenger is a selectee;

if the passenger is not a selectee, then control the scanner to scan a bag associated with the passenger by using the scanner system to obtain projection image data; and

if the passenger is a selectee, then control the scanner to scan the bag associated with the passenger by using the scanner system to obtain CT data.

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24. A system for scanning a bag to determine if the bag poses a threat, the system comprising:

- a scanner operative to perform a scan of a bag;
- 10 a visible light camera operative to obtain an image of the bag;
- a conveyor for advancing the bag past the visible light camera and through the scanner;
- a host processor in communication with the scanner and with the visible light camera and operative to:
 - 15 receive scan data from the scanner; and
 - receive image data from the camera; and
 - a detection processor in communication with the host processor and operative to:
 - receive scan data from the host processor;
 - receive image data from the host processor; and
 - 20 associate image data of a passenger bag with scan data of the passenger bag.

25. A system for scanning a bag to determine if the bag poses a threat, the system comprising:

- a CT scanner operative to perform a CT scan of a container;
- 25 a conveyor for advancing a container through the CT scanner;

a host processor in communication with the CT scanner and operative to receive CT data from the CT scanner; and

a detection processor in communication with the host processor and operative to:

receive CT data from the host processor;

5 analyze the CT data concurrently with performance of the CT scan; and

if analysis of the data indicates a potential threat that cannot be resolved through data modification and reconstruction, controlling the CT scanner to perform a high-resolution scan of the container.